Hamsoft for the TI-99

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Kantronics

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INTRODUCTION

The growing popularity of personal computers has added a new dimension to amateur radio. Software, or the program that defines the job for the computer, has become an important tool in the hobby. Kantronics has created Hamsoft to give you the ability to use a computer in the shack. Features of Hamsoft include:

SEND/RECEIVE MORSE CODE 5-99 WPM
SEND/RECEIVE RADIO TELETYPE 60, 67, 75, 100 WPM
SEND/RECEIVE ASCII 110, 300 BAUD
OPTIONAL UNSHIFT ON SPACE
OPTIONAL DIDDLE
PARALLEL PRINTER COMPATIBILITY
KEYBOARD AUDIO FEEDBACK
OPTIONAL AUTOMATIC ID
WORD WRAPAROUND
OPTIONAL AUTOMATIC CARRIAGE RETURN
OPTIONAL AUTOMATIC LINE FEED
MESSAGE PORTS STORAGE
TIME TRANSMISSION
CALLABLE FROM BASIC

Please take time to read the manual before you attempt operation of the program. You must understand the manual to use Hamsoft to it's fullest potential. If you have trouble in operation you can call Kantronics Customer Assistance during regular business hours: 8am to 12, 1pm to 5pm Central Time.

GROUNDING

The TI-99/4A and your tranaceiver were not designed to be connected together. The Kantronics Interface will do the job, but unless grounding precautions are taken, the results can be damaging to the computer or the Hamsoft module.

Simply grounding each of the components may not inaure against damage. ALL PARTS OF THE SYSTEM MUST BE CONNECTED TO A COMMON GROUND. Let'a look at the connection between the TI-99/4A and the Interface.

At this connection, a potential voltage differece may arise for a number of reasons, and this voltage can be the cause for damage.

1. Your transceiver ground may not be at the aame voltage potential aa the TV ground.
2. Your TV may be an older type and present a negative or large voltage to the TI-99. This may be OK if you are only using the TI-99, but may damage the Interface components.

As you can see, there are many ways in which a voltage difference can exiat between the TI-99 and the Interface. To inaure that this potential voltage is eliminated, you must ground all system components to a common ground. One word of caution, if you have an old TV, make sure that the TV antenna leads are isolated from the TI-99 TV connection since they may have a voltage potential.

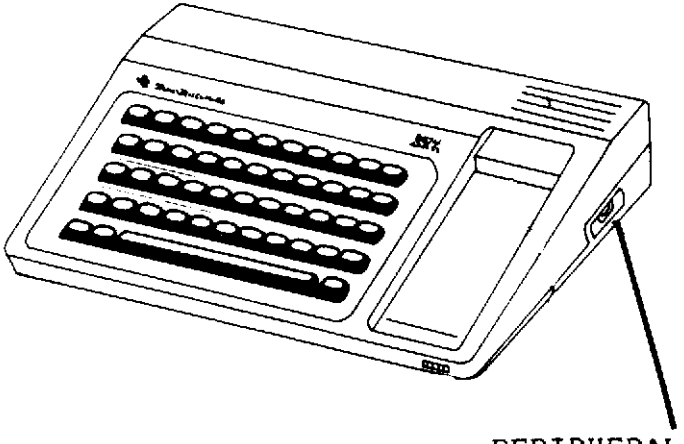
The 9901 chip can also be damaged by static electricity. Take care to avoid shocking the Hamsoft module. Always disconnect the Interface from the Hamsoft module before removing or inserting the module.

INSTALLATION

WARNING: DO NOT CONNECT THE HAMSOFT MODULE TO THE TI-99/4A UNLESS ALL CABLES TO THE MODULE ARE DISCONNECTED, AND THE COMPUTER IS TURNED OFF.

Installation of the Hamsoft program is a simple three step process.

First, with the computer power off, and no other cables connected to the Hamsoft module, connect the module to the peripheral jack on the side of the computer. See diagram.

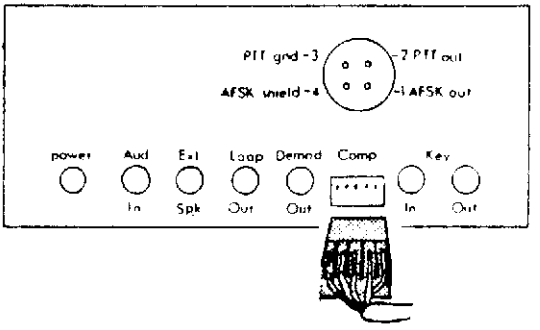


The Hamsoft module MUST be connected directly to the computer. Hamsoft cannot be used with any other peripheral, or the expansion box. Possible electrical damage could occur if the Hamsoft module is connected to a peripheral.

Second, remove the cable from the Hamsoft package and connect it to the Hamsoft module. Use the end marked with the blue dot. Insert the cable into the module with the blue dot on the bottom side.

Third, With the Interface power off, insert the other end of the cable into the Interface with the exposed wire side face up. See diagram.

The Interface Back Panel



Follow the instructions in the Interface manual for connecting the Interface to the transceiver. The single cable to the Hamsoft module is the only connection necessary to the computer.

Hamsoft is a versatile program with several options. To become familiar with Hamsoft, connect the Hamsoft module and leave the Interface cable disconnected. This allows you to practice in an "off the air" mode.

INITIAL OPERATION

WARNING: INITIALIZING THE HAMSOFT PROGRAM WILL ERASE ALL INFORMATION IN THE COMPUTER MEMORY. TO RETAIN THE COMPUTER MEMORY SAVE THE INFORMATION TO TAPE OR DISK.

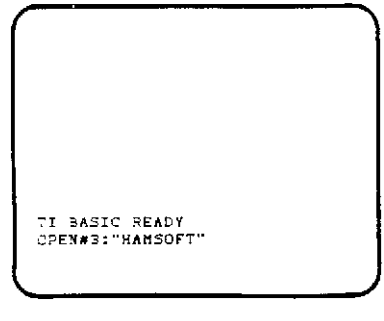
Once the Hamsoft module has been connected to the computer, you are ready to initialize the program.

IT IS IMPORTANT THAT YOU FOLLOW THESE INSTRUCIONS STEP BY STEP, TO BETTER UNDERSTAND OPERATION OF THE PROGRAM.

Turn on the computer and step into the BASIC mode. Since the program is addressable from BASIC you will need to type in the following command to initialize the program.

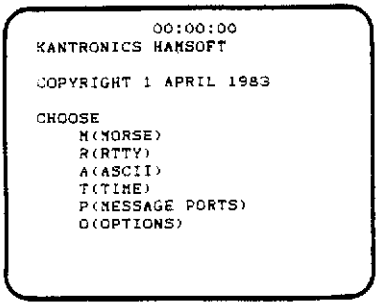
```
OPEN#3:"HAMSOFT"
```

The screen should look like this:



The command must be given in upper case. Make sure the ALPHA LOCK is down, placing the keyboard in the upper case mode.
Once the screen is exactly as above, press the ENTER key. This will initialize the program.

Now the main menu will appear on the screen:



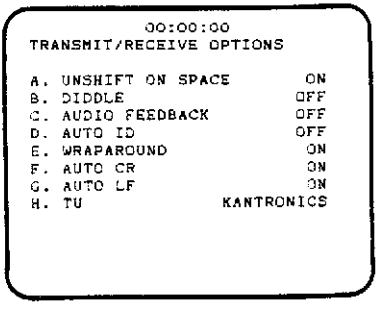
The menu gives you six choices. Each of the first three choices will give you a Transmit/Receive mode, either Morse code, Radio Teletype, or ASCII (American Standard Code for Information Interchange). The fourth choice sets the clock while the fifth choice enters the message ports mode. The sixth choice, OPTIONS, gives a menu of options that affect operation of the program.
First, lets look at the last choice on the menu, OPTIONS. Again, to better understand this program you should review the OPTIONS sections first, before attemping to use one of the Transmit/Receive modes. All options have a pre-set value or position. You should check each option to make sure it is in the proper position for your use.

TO RETURN TO THE MENU FROM ANY SPOT IN THE PROGRAM,HOLD DOWN THE FUNCTION (FCTN) KEY AND PRESS THE NUMBER 4 KEY. THIS IS THE ESCAPE TO MENU COMMAND.

OPTIONS

To select the OPTIONS mode depress the letter O on the computer keyboard.

The following should appear on the screen.



The following options directly affect operation of the Transmit/Receive modes. CAREFULLY READ THROUGH THESE INSTRUCTIONS BEFORE ATTEMPTING TO USE THE TRANSMIT/RECEIVE MODES.

Each option is set in an ON or OFF position. To change the option from ON to OFF, depress the letter to the left of that option. For Example, to turn the Unshift On Space feature OFF, you will depress the letter A. Press A again to change the option back to it's original ON position.

A. UNSHIFT ON SPACE ON - With this option ON, the program will automatically return to the letters mode after each space received in RTTY. When receiving some transmissions with multiple numbers transmitted in groups, such as National Weather Service Teletype, you will want to switch the UNSHIFT ON SPACE feature OFF. If a received signal seems to print illegibly, you might attempt changing the

UNSHIFT ON SPACE option to the OFF position. Normal operation would be to leave the unshift on space feature ON.

B. DIDDLE OFF - This option gives the program the ability to send a null character when there is no character in the transmit buffer. This allows the receiving station to have a solid signal, for tuning purposes, during pauses in transmission. The DIDDLE feature only affects RTTY/ASCII transmissions.

C. AUDIO FEEDBACK OFF - Option C allows you to hear an audio feedback of the computer keyboard if you are using a television as a monitor. With the option ON a "click" will be heard through the television speaker as each key is depressed.

D. AUTO ID OFF - With this option ON, the program will automatically transmit a CW-ID in the RTTY/ASCII transmit modes. Following every ten minutes of continuious tranmission, message port number 0 (zero) will be transmitted in the CW-ID mode. If you wish to use this option, place your ID into message port 0 (zero). How to place a message into the message port is covered in the MESSAGE PORTS section of the manual.

E. WRAPAROUND ON - To keep the program from breaking words at the end of a screen display line, the signal display jumps to the next line if a space is encountered in the last five spaces of the screen display line. To get more characters per line turn the wraparound option OFF. Wraparound works on both the receive and transmit displays.

F. AUTO CARRIAGE RETURN ON - During tranmission of RTTY/ASCII this feature sends a carriage return automatically at the first space encountered after 65 characters, or after the 71st character if there is no space. This option should not be used during transmission of data files where spacing and carriage returns should be embedded. For example, RTTY pictures.

G. AUTO LINE FEED ON - Again, in RTTY/ASCII transmit a line feed will be sent automatically with each carriage return. If the auto carriage return (Option G) is OFF the line feed will not be sent, as the line feed is programmed to occur with each carriage return.

To allow use of a printer in reception of Morse code, the program will also send a Carriage Return and Line Feed to the printer automatically during Morse reception.

H. TU KANTRONICS - Hamsoft is designed to be used with the Kantronics Interface. If you decide to use an alternate terminal unit, you will need to change Option H by pressing the letter H. This will change the screen to show OTHER in place of KANTRONICS. To connect your terminal unit check the ALTERNATE TU CONNECTION section of the manual.

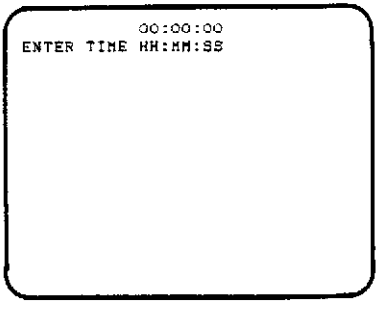
Hamsoft is warranted to work with the Kantronics Interface. We cannot guarantee operation of the program with any other terminal unit.

This completes the OPTIONS portion of the manual. To familiarize yourself with all the options available, attempt using the options without connecting the computer cable. Once you feel comfortable with the options, return to the main menu and follow the Transmit/Receive Instructions.

TIME

To enter the proper time into the 24 hour clock, select TIME from the main menu by pressing the T key.

The following screen should appear.

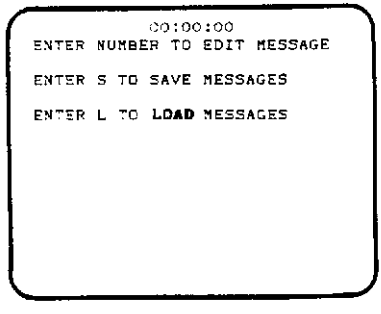


Enter the proper numbers to fill in the six digits. The program will not accept letters, or numbers that do not normally appear on a 24 hour display.
You must enter all six digits to exit this mode. Once all six digits are given, the program will return to the main menu.

MESSAGE PORTS

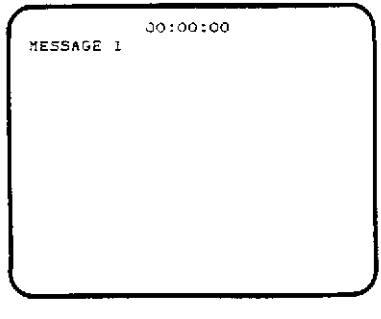
Hamsoft has a message ports feature, allowing you to preprogram up to 10 seperate messages, that can be loaded into the transmit buffer with a single command.
The message ports can be used to retain information that is used often during transmission. For example, your CQ or BRAG tape.

From the main menu press the P key for message ports. Now the screen will look like this.



Each of the 10 message ports are entered by pressing the number of the message port, 0 through 9.

Press a message port number and the screen will look like this.



To place information into the message port you simply type at this time. The normal TI-99 Function keys used for cursor control, and the Delete, Insert, and Erase keys work in the

Hamsoft program. Use these commands to place the text into the message port. For more information on the Function Keys see the Function Key Definition section of the manual.

Once the text placed into the message port is complete, use a Function 4 command to return to the menu. This is done by holding down the Function (FCTN) key and pressing the number 4. This places the text into the message port for use in the transmit/receive modes.

Each message port will hold a maximum of 256 characters.

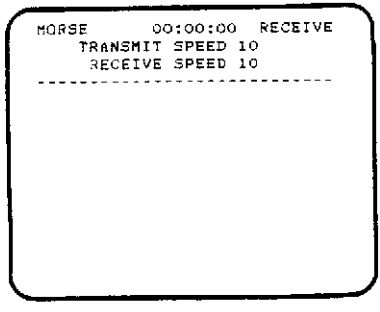
When you turn the computer off, or exit the program, the message ports will be erased. You can save the message ports to cassette tape by following the saving procedure. From the message ports mode select S to save messages. From this point on the procedure to save the message ports is the same as the saving procedure outlined in the TI-99 reference manual. See page 1-10 in the TI-99 manual.

To load your message ports back into the computer memory select the L to load messages. Again follow the standard TI-99 procedures for this function. Loading message ports from the tape will erase any message ports in the computer, replacing them with the loaded information.

RECEIVE MODE

To explain operation of the Receive modes we will step through operation of the Morse Code Receive mode. All three of the modes are very similar, and operation is almost identical.

From the Main Menu select the Morse Code Transmit/Receive mode by pressing the letter M key. Your screen should look like this:



The lower portion of the screen is the receive area. Incoming Morse code signals are decoded and displayed on this portion of the screen. As the signal is received it will scroll upward and off the screen.

The top portion of the screen is the Status Banner. On the present screen you will see MORSE in the upper left hand corner. This reminds you that you are in the Morse Transmit/Receive mode. Directly below this you will see TRANSMIT SPEED 10 and RECEIVE SPEED 10. The Receive Speed indicator will automatically give you the speed of the incoming morse signal. The Transmit Speed indicator allows you to set your transmit speed from 05 to 99 words per minute.

In the upper right hand corner is the RECEIVE indicator. When you go to the transmit mode the indicator will change to TRANSMIT.

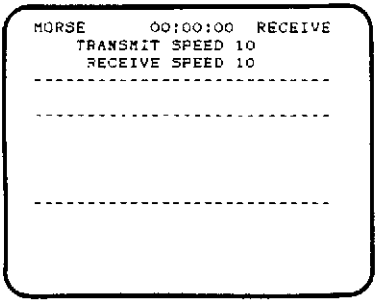
Follow the tuning instructions in the Interface manual and tune in a Morse Code signal. Make sure you have connected the computer cable to the Interface and the Hamsoft module.

The only differences for receiving RTTY or ASCII instead of Morse Code, are in tuning the signal and selecting the speed. For RTTY or ASCII signals you must select the proper speed of the incoming signal, while the program automatically adjusts to incoming Morse signal speeds. To change the receive speed for RTTY or ASCII, press the Function 7 command by holding down the Function (FCTN) key and pressing the number 7. The function keys are explained in detail in the Function Key Definitions section of the manual.

TRANSMIT MODE

During the receive mode most of the screen is used for reception. The type ahead feature of the Hamsoft program allows you to type information into the transmit buffer while receiving.

With the first character typed while receiving, the screen will divide into four sections:



The status banner remains the same, while the receive portion of the screen is reduced. Two new areas appear on the screen, the transmit buffer and the transmission line. The transmit buffer shows information typed in, while the transmission line displays the actual signal being sent. The transmit buffer has a capacity of 1024 characters.

OPERATION COMMANDS

While in the Transmit/Receive or message ports mode, Hamsoft uses two types of keyboard commands to allow you to manipulate the program; Function Key commands and Control commands.

Function Key Commands- The top row of keys on the TI-99 keyboard, the number keys, are used as function keys. By holding down the Function (FCTN) key and pressing the number key a special function command is given. Hamsoft uses ten function key commands.

FUNCTION KEY DEFINITIONS

FCTN 1 - DELETE - Function 1 is used as the delete key. The Hamsoft program delete key operates exactly the same as the TI-99 Delete function. FCTN 1 works only for editing data in the message ports mode. To edit data in the transmission buffer use a FCTN S command to backspace and erase mistakes. Hamsoft does not allow complete cursor movement in the transmit/receive mode, only in the message ports mode.

FCTN 2 - INSERT - Function 2 is used as the insert key. The Hamsoft program insert key operates exactly the same as the TI-99 Insert function. FCTN 2 works only in the message ports mode.

FCTN 3 - ERASE - Function 3 is used to erase text entered into any message port. Function 3 will erase all text from the cursor to the end of the port. This function does not work in the transmit/receive mode.

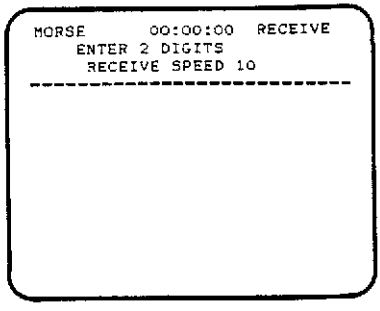
FCTN 4 - ESCAPE - Function 4 returns the program to the main menu.

FCTN 5 - RECEIVE - Function Key 5 places the program in the receive mode. To return to receive from transmit simply depress function key and the number 5. Function key 5 can also be used to synchronize the program to incoming signals. If the signal seems to be properly tuned but not printing legibly, depress function key 5. This may help the program to properly decode the signal, especially when receiving Morse code. With each Function 5 command given a Carriage Return/Line Feed will be sent to the printer.

FCTN 6 - TRANSMIT - This function transmits any text in the transmit buffer. You can type into the transmit buffer while receiving, then press function 6 to transmit the message. Information placed into the transmit buffer will not be sent until the FCTN 6 command is given.

FCTN 7 - CHANGE SPEED - In the Morse Transmit/Receive mode, function 7 will allow you to set your transmit speed from 5 to 99 words per minute. Function 7 will not work while in the Tramsmit mode.

While in the receive mode depress function 7. Your screen should look like this:



Enter two digits to set the transmit speed. Once the digits are entered the display will show the new transmit speed.
In the RTTY/ASCII Transmit/Receive modes function 7 will cycle through the available speeds. RTTY 60, 67, 75, and 100 words per minute - ASCII 110 and 300 baud. With each speed change a Carriage Return/Line Feed is sent to the printer.

FCTN 8 - INVERT - A common practice in using radio teletype is to invert a signal, reversing the space and mark frequencies. Function 8 allows you to invert the incoming radio teletype or ASCII signals, to check for inversion. In the inverted mode the letter R in RTTY status banner will be reversed on the screen. In the ASCII mode the letter A will be reversed. Transmitted RTTY/ASCII signals will not be affected by Function 8.

FCTN 9 - PRINTER ON/OFF - Function 9 toggles the printer ON and OFF. A letter P will appear in the status banner when the printer is ON.

All received and transmitted signals will be dumped to the printer. For printer connection instructions check the PRINTER ATTACHMENT section of the manual.

FCTN = - QUIT - Holding down the FCTN key and pressing the = key will return the computer to it's initial power on stage. This allows the operator to exit the Hamsoft program while leaving the Hamsoft module connected. This feature gives versatility to the operator in use of other programs quickly and easily.

CONTROL (CTRL) COMMANDS

In addition to the ten Function Key commands, Hamsoft has seven Control (CTRL) commands. The CTRL commands are given by holding down the CTRL key and pressing the proper letter or number. Each of the control commands appears on the screen as a reverse letter or number. For example, Placing message port number 1 into the transmit buffer will appear as a reversed number 1 on the screen.

CONTROL COMMAND DEFINITIONS

CTRL E - RETURN TO RECEIVE - When encountered in the transmit buffer this command returns the program to the receive mode. For an automatic return to receive at the end of transmission, place a CTRL E at the end of the message.

CTRL T - TIME TRANSMISSION - To place the clock time into the transmit buffer give a CTRL T command. When the command is encountered in the buffer, the hours and minutes displayed on the clock will be sent. The CTRL T command can be placed into a message port, and the time displayed when the command is transmitted will be sent.

CTRL I - CW-ID - A CW-ID is necessary for identification during transmission of RTTY or ASCII. To place your CW-ID into the transmit buffer, put a CTRL-I command before and after the ID. The ID will be sent at the Morse mode transmit speed. For ease of operation, place your ID into message port 0.

This will allow you to send the ID manually with a single command, or to use the AUTO ID, outlined in the OPTIONS section of the manual. Make sure to place the CTRL I commands both before and after the ID when programming the message port.

CTRL (NUMBER 0-9) - MESSAGE PORTS XMIT - To transmit a message port, use a control command with the number of the message port. For example, if your ID is in message port 0, hold down the CTRL key and press the 0 key. This will place the port into the transmit buffer. The reversed number of the port will appear in the transmission portion of the screen, but the actual message port will appear on the transmission line as the signal is sent.

CTRL M - CARRIAGE RETURN - If you wish to send a manual carriage return give the CTRL M command.

CTRL J - LINE FEED - To send a line feed manually use a CTRL J command.

ENTER - Pressing the ENTER key will send both a carriage return and line feed.

SPECIAL CHARACTERS

The following abbreviations can be placed in the transmit buffer for transmission of special characters.

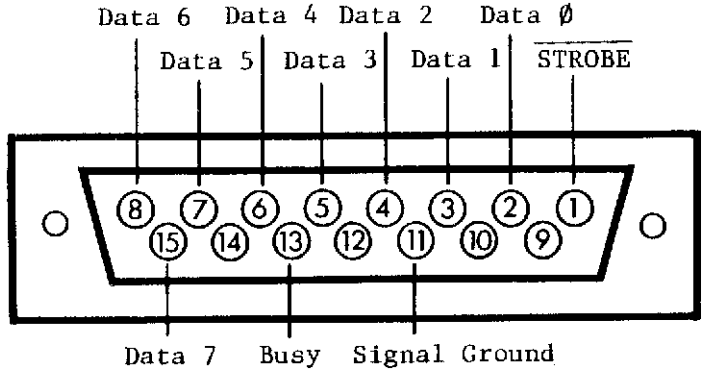
SYMBOL	ABBREVIATION	MEANING
$	AR	End of message
=	BT	Break or pause
%	AS	Wait
&		Attention
#	SK	End of transmission
+	KN	Inviation to transmit
*	AA	All after

PRINTER ATTACHMENT

The following guide will allow you to connect any Centronics compatible parallel printer to the Hamsoft module. You will need a 15-pin male D connector and the proper connector for your parallel printer port.

Wire the 15-pin male D connector as shown, and attach to the Hamsoft module. Connect the lines to the corresponding function pins of

the printer connector, according to the printer manual. Make aure the aignal ground is used, not the chaais ground. If your data lines are labeled 1 through 8, instead of 0 through 7; use pin 2 for data 1, pin 3 for data 2, pin 4 for data 3, and so on.



The Hamsoft module can also be used as a parallel printer interface, for use with the basic functions of the TI-99. To use this function the printer device name is "PP". This means you would use the following program to simply print information.

```
10 OPEN #1: "PP"
20 PRINT #1: "QUICK BROWN FOX"
30 CLOSE #1
```

This program would print QUICK BROWN FOX. To LIST a program, a LIST "PP" command would be used.

ALTERNATE TU CONNECTION

This software is written for use with the Kantronics Interface; therefore Kantronics does not warrant the use of Hamsoft with any other terminal unit. However, if you choose to use an alternate TU we suggest the following connections:

TERMINAL UNIT	FUNCTIONS
White-CW Key Out	Morse signals, active low
Red-RTTY Out	RTTY/ASCII signals, Mark high, Space low
Brown-Receive/Send	Normally high, active low for RTTY/ASCII transmitting
Green-Demod In	Normally high, active low when Morse signal present, active low when space frequency present.
Black-Ground	

CAUTION-Make sure the voltages on the lines of your transceiver and TU are TTL level compatible, not RS232. Kantronics is NOT responsible for inter-connection of any hardware not of our manufacture.

TROUBLESHOOTING

To check for problems in operation of the Interface/Hamsoft system it is necessary to isolate the problem. This is done by connecting all components in the order given below. You must follow these instructions exactly for the troubleshooting system to work.

1. Turn power off and disconnect all cables.

2. Connect the Hamsoft module to the TI-99/4a.

3. Turn the computer on. Step through to the BASIC mode and give the OPEN#3:"HAMSOFT" command, and the Main menu should appear. Check the Morse, RTTY, ASCII receive and transmit displays. While in each mode input random characters and transmit. You should hear the transmitted signal through the television speaker. If the signal is transmitted and the tones are heard, the Hamsoft program is operating correctly.

4. Turn the power off again. Attach the computer cable to the Hamsoft module and the Interface. Also connect the cable from the external speaker of the receiver to the audio in of the Interface, and attach the external speaker to the Interface.

5. Power on the computer, Interface, and transceiver, in that order.

6. Tune in a RTTY or Morse signal and check for operation of the 10 segment bar graph on the front of the Interface.

7. Initialize the Hamsoft program and step to the appropriate receive mode. Tune the signal until letters begin to appear on the screen. Display of characters at this point means that both the Hamsoft program and Interface are operating properly.

8. By carefully tuning the signal you should be able to get legible display. Not all signals are acceptable, if the first does not print, try another. Following the tuning instructions included in the Interface manual.

9. Now tune to signals in other modes. Once you have properly received Morse and RTTY signals, add the cable for transmission. If problems arise as you attach additional cables, you have an improper cable connection. Check the Interface manual for correct cabling instruction.

Follow the troubleshooting steps exactly. By stepping through the troubleshooting guide you will be able to isolate the problem.

WARRANTY

Kantronics warrants each new Hamsoft to be free from material, workmanship, and program defects under normal use and service for a period of 90 days. Following this period, for nine months, Kantronics will replace or repair, at our option, your Hamsoft at cost plus shipping and handling.
This warranty is void if any attempt has been made to copy or alter the software.